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TITLE II - DWIGHT D. EISENHOWER PROFESSIONAL DEVELOPMENT PROGRAM

HIGHER EDUCATION COMPONENT

DIRECTORY OF 1996 - 1997 PROJECTS

GOVERNMENT DOCUMENTS
COLLECTION

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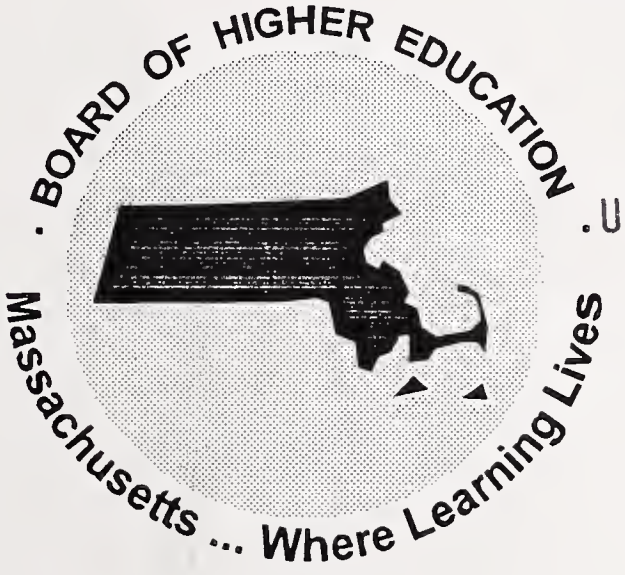

Massachusetts Board of Higher Education
McCormack Building, Room 1401
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Boston, Massachusetts 02108-1696

Eisenhower Project Sponsoring Institutions

Bridgewater State College
Cape Cod Cooperative Extension
Clark University: Worcester Public Schools
Clark University: Complex Instruction
Greenfield Community College
Hampshire College
Harvard University
Lloyd Center for Environmental Studies
Massachusetts Audubon Society: Environmental Frameworks
Massachusetts Audubon Society: Natural History
Massachusetts College of Art
Massachusetts Corporation for Telecommunications
Merrimack College
Mount Holyoke College
Northern Essex Community College
Simmons College
Springfield College
Springfield Technical Community College
Thompson Island Outward Bound Education Center
University of Massachusetts Amherst: The STEM ED Project
University of Massachusetts Amherst: Implementation of Technology
University of Massachusetts Boston
University of Massachusetts Dartmouth
University of Massachusetts Lowell
Wheelock College

Bridgewater State College
The Moakley Center/CityLab Connection Project

The Moakley Center/CityLab Connection Project will provide real-life science research applications for professional development to educators in the Brockton and Bridgewater-Raynham Public School Districts. The teachers will become facilitators of this knowledge of their classrooms, and the students will become participants in the City/Lab experience.

The Goal of the Moakley Center/CityLab Connection Project is to continue this outreach by making this professional development experience available to twenty-five educators from the Brockton and Bridgewater-Raynham Public Schools. Additionally, the professional development will allow for more intensive experiences in the CityLab facilities as well as exposure to additional CityLab explorations.

The Moakley Center/CityLab Connection Project has the following objectives:

- To provide twenty-five educators from Brockton to Bridgewater-Raynham Public Schools with professional development in biotechnology through the CityLab explorations.
- To provide graduate credit experience that will explore in-depth inquiry-based pedagogy and science content area.
- To combine the expertise of CityLab educators and faculty members to deliver professional development experiences.
- To require the teachers to bring their respective classed through CityLab experience.
- To adapt CityLab experiences to local curricula needs, addressing the Curriculum Frameworks and PALMS principles.

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Cape Cod Cooperative Extension

Placing Environmental Education Resources in Schools on Cape Cod

Placing Environmental Education Resources in Schools on Cape Cod (P.E.E.R.S.C.C.) is a comprehensive program of the Cape Cod Cooperative Extension in collaboration with the Cape Cod Environmental Education Resource Center at Cape Cod Community College. In this second year of receiving DD Eisenhower funds includes:

- INSERVICE COURSE AND WORKSHOPS AT DIFFERENT LEVELS GRADES K-12 on Cape Cod from October 1996 through July 1997. Participants receive Professional Development Points (PDP's) and option for graduate credits from the University of Massachusetts Amherst.

- A PEER LEADERSHIP STRAND that will encourage previous DD Eisenhower program graduates to become mentors for teams of teachers in their schools.

- VISITS TO OUTDOOR STUDY SITES at a minimum of four schools as part of a class session.

- ACCESS TO THE PEERSCC WEB Site for all grade levels. The 1997 PEERSCC Program will connect school districts through the Cape Cod Environmental Education Resource Center PEERSCC WEB Site.

- ONGOING SUPPORT TO CAPE COD SCHOOLS. The resources of the Environmental Education Resource Center at the Community College Library, now expanded, will assist teachers in finding resources along with loan of books, media and educational models.

For more information, please contact:

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Clark University

Clark University-Worcester Public Schools K-16 Professional Development Collaborative

The project involves the continued development of a fully collaborative and comprehensive K-16 model of professional development, focused on a set of four schools, three of which are in the "south quadrant" of Worcester, socially and ethnically the most diverse area of the city, and arguably in greatest need economically.

Expanding a process launched this year, the project will concentrate over the next 2-3 years on building an understanding, in both concept and practice, of curriculum frameworks and related assessment practices, as well as the principles of effective teaching. The expanded process will entail identifying and supporting the development of new teacher-leaders, together with Clark liberal arts and education faculty. These colleagues will form expanded (from the original teams established in January 1996) multi-level (K-16) curriculum study and planning teams responsible for planning and facilitating summer 1997 "Curriculum and Knowing" professional development in the arts, humanities, mathematics, physical and national sciences, and social sciences. Members of these teams will also support, on-site and in quarterly seminars, the development of teachers' practice in light of the priorities of educational reform, mentor Clark masters students and contribute to the evaluation and development of the collaborative "Ways of Knowing" courses for teacher preparation students. These activities reflect the overall effort of the Collaborative to unite the strengths and resources of each institution in building a comprehensive and self-sustaining professional development program which fulfills the goals of educational reform in Massachusetts and the country.

The project objectives are:

- to integrate liberal arts faculty into the effort to create a K-16 collaborative focused on supporting professional development at all levels-from teacher preparation through standard certification and onwards to include experienced teachers.

- to establish an interdisciplinary program committee composed of liberal arts (at least one from each core discipline) and education faculty and responsible for overseeing program development, evaluating programs in light of curriculum frameworks and the principles of effective teaching, and developing a process for institutionalizing liberal arts faculty involvement.

- to develop new teacher-leaders in each of our collaborative schools, to serve as resources for colleagues in implementing new curricular and assessment approaches, as co-instructors in the summer 1997 "Curriculum and Knowing" institutes, and as mentors for students in the teacher preparation programs.

- to incorporate new curricular and assessment approaches in the daily practice of teachers who serve in our collaborative schools and who are resources for the teacher preparation programs. Teachers who participate in summer institutes will receive support by attending progress report meetings conducted by members of the multi-level curriculum teams.

- to plan and conduct 1997 "Curriculum and Knowing" professional development institutes in the arts, humanities, mathematics, physical and natural sciences and social sciences, each focused on a curricular theme, assessment practices, and pedagogical strategies reflecting state frameworks and guidelines.

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Clark University

The Complex Instruction Project: A Model for Advanced Professional Development

Cooperative education and inquiry-based curricula are important ingredients of improved science and math education, but they are not in and of themselves adequate solutions, especially in urban schools where teachers face special challenges. Their classrooms are heterogeneous and often multilingual. They have a wide set of academic achievements and preparation; many students are unable to read at grade level. Therefore, when teachers use activity based and student centered curricula they face problems of implementation. Teachers often receive little preparation, organizational or scientific support for these attempts. In heterogeneous classrooms it is necessary to address the issue of equity in groups and to provide multiple opportunities for learners to grasp difficult concepts. We feel that Complex Instruction provides an important link between content and pedagogy which can enhance the ability of teachers to provide high quality science and math education for today's increasingly diverse school populations.

The Complex Instruction (CI) Project is a five year long collaboration between the Hiatt Center for Urban Education at Clark University and the Goddard School of Science and Technology, a Worcester Public elementary school. This innovative project features sustained staff development and support for teachers to implement and become expert in teaching science and math using a hands-on curriculum that supports high level conceptual learning for *all* students in a diverse urban population. During the 96-97 year, we will offer staff development to 1) further disseminate this intervention by supporting experienced CI teacher-researchers, working closely with an environmental scientist, to develop, adapt, pilot and assess curriculum units which are closely tied into state and national frameworks so that the many teachers whom we have trained over the course of the last three years will have adequate curriculum; 2) create a collaborative project with experienced curriculum developers from Stanford University who have devised a model of advanced professional development through curriculum work; 3) provide supportive classroom feedback to newly trained teachers.

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Greenfield Community College

ScienceWorks

Greenfield Community College and the Hitchcock Center for the Environment will be sponsoring *ScienceWorks*, a two part series of professional development workshops focusing on the physical sciences. This year the topic will be electricity and magnetism. A total of 40 teachers from grades 4-6 will be recruited to attend one of two seminars consisting of 8 workshops for a total of 30 hours. Participants will receive a stipend or graduate credit from North Adams State and materials to build curriculum kit.

The ScienceWorks Seminars seek to facilitate implementation of the Science and Technology Frameworks by increasing the competency of teachers in the domain of the physical sciences. In order to achieve this goal the ScienceWorks curricula will follow a three-pronged approach that focuses on high quality content, inquiry based methodology, and the production of curriculum kits to assist teachers in applying inquiry-based activities in their classrooms. Kits will include demonstration materials to be used by teachers in their classrooms. Teachers will be expected to provide in-service training at their home schools.

To address issues of gender equity, The Gender Equity Center of Western Massachusetts will present a workshop on the inclusive classroom. The major topics will include strategies for increasing the comfort level of female teachers and students in the physical sciences and ways to better understand gender bias in the classroom.

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Hampshire College

Partnership/Eisenhower Project

The Partnership/Eisenhower Project reflects the recommendation of the National Science Education Standards, the Massachusetts State Professional Development Plan, the Massachusetts Common Core of Learning, the Curriculum Frameworks in Mathematics, Science & Technology, and the school and college faculty participating in the previous project.

There are four components to the project:

- an academic year and summer field-based geology workshop for earth science teachers (and teams of teachers led by the earth science teacher). This project was new to the Partnership this past year. This year's project will include a fall 3-part series at Mt. Toby on glacial geology, *Buried in Ice*; a 4-part winter series at Pratt Museum, Amherst College and at the University on cross-sectional mapping, *Indoor Geology*, a 3-part spring series in the Mt. Tom area on the Triassic and Jurassic Periods, *When Dinosaurs Roamed*; and a 5-day summer workshop at the Quabbin, *Gneisses and Groundwater*.

- an academic year and summer series for secondary mathematics teachers focusing on using educational technology to enhance the teaching of mathematics. This is a new project. During the winter, teachers will meet 5 times in each other's classrooms to share experience with software and hardware. In the summer, they will attend a one-week workshop on TRANZ, a transformational software program designed to be used by students with a wide range of mathematical skills.

- an academic year program including two conferences to strengthen the school-college faculty partnership in the *Day in the Lab* project. Hampshire College began working with these teachers on the process of teaching science just this spring. The fall conference will focus on water, the spring on air.

- the annual directory of Eisenhower Collaborative Projects - published both on the web and on paper. This is a continuing project activity.

The project evaluation will include participant information on goals, indicators of success and general suggestions as well as follow-up evaluations to determine impact in the classroom. The follow-up evaluation will focus primarily on the summer 1996, fall 1996, and winter 1997 earth science workshops.

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Harvard University

Boston-Harvard Institute for Teaching Science (Grades 6-12)

Phase I is a 10-day Institute, occurring on alternate Wednesdays from January to May (1997), which helps approximately 40 Boston teachers of science, grades 6-12 understand and critically appropriate for their own practice the recommendations of science teaching and learning that appear in the Commonwealth's Common Core and Science and Technology Curriculum Frameworks, the National Science Education Standards, and the new draft Science Learning Standards (SLS) of the Boston Public Schools. Activities include 1) large and small group discussions of science reform documents, 2) participation in hands-on science designed to illustrate inquiry science teaching, 3) presentations by practicing scientists and science educators from the Harvard University School of Medicine, Graduate School of Education and Faculty of Arts and Sciences, and 4) composition of personal professional development plans for further work in reformed science teaching and learning.

Phase II includes 1) a one-day call back session for 60 graduates of last-year's Institute and of the PALM/Museum of Science Mini-Sabbatical Program to study the new draft SLS and 2) a series of 8 afternoon workshops during January through May where 24 of these graduates will study and pilot in their classrooms select Student Product Protocols which are required by the SLS.

The success of Phase II will be demonstrated by teachers who 1) say they are confidently knowledgeable about the ideas of science and science education embedded in the science reform documents and 2) have developed an individualized professional development plan for their use in science education reform.

The success of Phase II will be demonstrated by teachers 1) who say they are well informed about the content and methods of the SLS and 2) have piloted the Student Products of the SLS and reported on their experience with them.

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Lloyd Center for Environmental Studies

Fall River Forest Ecology Program

A series of five professional development workshops will be conducted for Fall River middle school teachers during 1996-97 school year. These workshops will immerse teachers in strategies, techniques and activities to assist them in teaching life and earth sciences in a non-traditional setting (Tattapanum Forest Trail) ideally suited for PALMS learning. Professional environmental staff will assist teachers in refining and implementing the Fall River Forest Ecology curriculum in grades 6-8.

Objectives:

- To develop a core group of middle school teachers to facilitate the Fall River Ecology Program in grades 6-8, who will provide continued training of new teachers in their district.

- To foster professional development training for middle school science teachers in Fall River which encourages an inquiry-based approach using real world scientific techniques and is consistent with PALMS principles and the Massachusetts Education Reform Act of 1993.

- To implement a forest ecology program in Fall River Middle schools, which will become a permanent component of their science curriculum.

- To provide middle school teachers with a multi-disciplinary program to enhance the teaching of science in Fall River.

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Massachusetts Audubon Society

The Environmental Frameworks Project

In response to widespread interest in the new Massachusetts Curriculum Frameworks and constructivist theory, The Massachusetts Audubon Society has developed the Environmental Frameworks Project. While many teachers and administrators have a working knowledge of both the Frameworks and "constructivism" as a pedagogical theory, few grasp how to apply either in an elementary classroom setting. The Environmental Frameworks Project has two goals:

1. Provide teachers and administrators with techniques, using an environmental theme, that enable teachers to do hands-on, constructivist classroom lessons, and

2. Allow teachers from a variety of situations to interact and learn from each other in a workshop environment.

The Project is designed to work with eighteen schools in five school districts. We will provide professional development services for teachers in Melrose, Hudson, Cambridge, Medford and Norton. The students in these schools will immediately become more engaged in learning mathematics and science.

Each school system will receive services tailored to meet their perceived needs. The different services include a summer institute, workshops, classroom "modeling" sessions, and field trips to a variety of natural sites. All of the activities will be tied together by their emphasis on the use of natural resources such as a school yard or a local park for the teaching of mathematics and science. The first goal of these lessons will be to apply the curriculum frameworks to outdoor science and mathematics using an inquiry based, learner directed approach. The second goal will be to facilitate the creation of interdisciplinary lessons and projects that have practical applications in the classroom.

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Massachusetts Audubon Society

Natural History of the Schoolyard: Thematic Curricula -Year II

Natural History of the Schoolyard: Thematic Curricula will provide a professional development program for 48 teachers, grades K-12, from throughout the Connecticut River Valley which includes Franklin, Hampden, and Hampshire Counties.

In this second year, we are taking the next logical step in the learning process and are helping teachers to take the information they've learned and develop tangible products. We are facilitating a process in which teachers will apply Curriculum Frameworks, implement the PALMS approach, use the medium of environmental education (as recommended in the Common Core of Learning), and generate integrated thematic units which will emphasize math and science, but also integrate portions of the five remaining Frameworks (Social Studies & History, English/Language Arts, World Languages, The Arts, and Health). Specifically, each focus group, will be made up of 3-4 teachers, will create an age/ability appropriate thematic unit that will be printed and distributed to all participants for use in their schools and for sharing with their colleagues. We hope in this way to reach educators far beyond those that are participating in this grant program.

- Two orientation days focusing on a review of the Massachusetts' 1993 Education Reform Act, including an examination of the Common Core of Learning, Curriculum Frameworks, Alternative Assessments, Cooperative Learning, and the PALMS approach. One day will be a brainstorming session on the practicality of topics for the integrated thematic units, as well as a discussion on what should be part of developing an Investigation.

- Seven, 6 1/2 hour days of facilitated professional development, one day per month, November through May. During these days, participants will learn about content/approach, enjoy a networking lunch, and break into focus groups to work on the design of their integrated thematic units.

- Six, 90 minute required focus group meetings, whose purpose is to keep the group on track and allow them to meet in alternative locations. The location of the meetings will depend on the individual needs of each focus group. For example, some participants may want to visit a library or museum, individual schools, access the Internet, or visit one of Mass. Audubon's sanctuaries, etc. These six meetings are interspersed between the regular monthly meetings and all groups must submit a one-page summary of the activities completed at each meeting.

At the completion of this program, 48 teachers will have created up to twelve, 30-50 pages, integrated thematic units that will be reproduced by a commercial printer. Each participant will receive a full set for use and sharing with their colleagues as examples of teaching under the 1993 Education Reform Act.

For more information, please contact:

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Massachusetts College of Art and McKinley Vocational Technical High School

Art Inspired Learning and Teaching

This project pairs pre-service art education students and in-service teachers of special education together for the purposes of designing and implementing arts-infused, interdisciplinary curriculum. The proposal came about at the request of MCA students engaged in pre-practicum hours at the site and the teachers/administrators of McKinley, a Boston Public School servicing students presenting severe emotional/behavioral/social issues. It is a dynamic model which is founded upon collaboration amongst teachers and involves actual implementation with McKinley students.

This program funds opportunity. The professional development structure provides for specific exchange between pre-service and in-service teachers on-site as well as the integration of expertise from school-based administrators, college faculty and visiting artists. Authentic assessment tools are utilized by students, pre-service teachers and in-service teachers in hopes of modeling best practice for reflection, responsibility and lifelong learning.

In addition to weekly work with McKinley students, two all day, whole community art-making events are planned. Professional development for both pre-service and in-service teachers will occur both semesters and a final exhibition of all student and teacher work will open in June.

For more information, please contact:

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Massachusetts Corporation for Telecommunications

High Seas

The Massachusetts Corporation for Educational Telecommunications (MCET) proposes the development, production, distribution, and assessment of a distance learning series for science teachers, titled High Seas. High Seas will offer teachers: an opportunity to advance their students' knowledge through participation in interactive broadcasts; statewide interaction on MCET's Mass Ed Online LearnNet computer network; content and curriculum materials designed to meet national standards and statewide curriculum frameworks; access from every school district in the Commonwealth; Professional Development Points (PDPs) toward state recertification. Science teachers and administrators serve as advisors to MCET, providing "customer input" in MCET's development of new teaching resources for improvement of students' core science curriculum learning.

The future scientific research, and the resulting advances in knowledge it spawns, depends directly on how successfully the nation cultivates its human resources. This project seeks to serve this understanding by increasing teachers' and students' science interest and aptitude. MCET technologies, with their power to deliver quality professional development opportunities equitably statewide, offer new promise to traditionally underserved communities and students.

MCET builds youth and adult learning communities by using combinations of technologies to link schools and community groups from diverse ethnic, economic and geographic locations. MCET develops and distributes programming targeting the needs of underserved populations in rural and urban communities, using new telecommunication and instructional media to involve learners in a variety of subjects and to promote career interests.

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Merrimack College

R.A.I.S.E. (Resources to Accelerate Integrated Science Education)

This project presents a seminar series for elementary school teachers in Lawrence, MA, to provide them with the technical guidance needed to produce a developmental, integrated science curriculum for grades K-6. The goal is to create a model for enhancing science education by providing classroom teachers with practical, non-textbook science training and support, and an ongoing source of appropriate resources. Training is provided in Chemistry, Physics, Biology and Mathematics experiments to 22-24 teachers.

The program helps children develop systematic observation, recording, measuring, and predicting skills. After the teachers perform the experiments in the seminar, they replicate them in their classrooms with materials and equipment provided by the college. They return with student responses. Teachers also develop new experiments based on supplementary materials distributed in seminars.

Approximately 500 students a year perform between 15 and 25 experiments through this program. An additional 200 students participated in experiments conducted by Merrimack College Faculty.

During the summer, a week-long science camp for 45 students is held on the Merrimack campus. Six of ten of the teachers who have been through the training conduct hands-on experiments with students under supervision of college faculty in Chemistry, Biology, Physics, and Mathematics.

In 1996-97, the project is contributing more systemic change through collaboration with the Lawrence School Department and other outside providers to integrate external programs with the new science curriculum and with available Windows on Science Technology.

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Mount Holyoke College

Learning Mathematics, Teaching Mathematics
SummerMath for Teachers (SMT)

Through Learning Mathematics Teaching Mathematics, SMT will offer two content courses for teachers and a series of seminar meetings for administrators.

Conceptual Foundations for Teaching Elementary Mathematics

Summer Math for Teachers is offering a course designed to allow teachers to explore the mathematical content of the elementary curriculum. CFTEM meets weekly from 4 to 7 on Tuesday evenings starting in mid-September and ending in mid-December. Mathematical topics to be addressed include: a study of whole numbers through a focus on the nature of the number system, multi-digit computations, and a study of the structure and the relationships among the four operations; fractions; and topics from geometry and measurement.

The course will be taught in a manner which is consistent with the instructional approaches being suggested by the mathematics reform movement and will award four graduate credits in mathematics education. Course Instructor: Jill Lester at 413-538-2654 or jlester@mhc.mtholyoke.edu

Conceptual Foundations for the Teaching of Calculus

Using small group instruction, computer program explorations, and writing as a tool for learning, the course Conceptual Foundations for the Teaching of Calculus (CFTC) provides the means for teachers of grades 7 -12 to investigate the mathematical ideas underlying the concepts of calculus. While the text, Calculus in Context (developed through the NSF-funded Five Colleges Calculus Project) serves as curriculum, the course is responsive to the needs and backgrounds of the participating teachers. The class will be taught in a manner which is consistent with the instructional approaches being suggested by the mathematics reform movement and will award four graduate credits in mathematics education. CFTC meets twice a month throughout the school year (September to May) on Tuesdays from 4 to 7. Course Instructor: Virginia Bastable at 413-538-2071 or vbastabl@mhc.mtholyoke.edu

The Mathematics Education Reform Administrators' Seminar

SummerMath for Teachers continues to offer administrators the opportunity to meet and discuss topics related to staff development and the teaching of mathematics. The Mathematics Education Reform Administrators' Seminar meetings for the 1996-1997 school year will be held on the second Friday of each month during the academic year from 9:30 to 12.

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Northern Essex Community College

Merrimack River Valley Investigations in Science (MRVIS) Project

The Merrimack River Valley Investigations in Science (MRVIS) is a project designed by Northern Essex Community College (NECC) in collaboration with the Amesbury, Dracut, Georgetown, Haverhill, Lawrence, Methuen and Newburyport Public School systems and the Masconomet and Pentucket Regional School Districts. This project will conduct professional development short courses and workshops for local teachers which empower the teachers to infuse into their classrooms the units of hands-on science developed in Year One through Year Three of MRVIS as well as other appropriate science and mathematics materials such as GEMS from the University of California at Berkeley.

New to this year's grant will be a workshop on an interdisciplinary approach (involving geography, history, government and science) to a local bog and help for participating school districts in building partnerships with local businesses. The units were designed to utilize the unique resources of the Merrimack River Valley as the site for a series of laboratory and field experiences for grades five through nine dealing with the Earth, Physical, Chemical, Life and Environmental Sciences. The work done under this year's requested grant will be disseminated to the participating schools and teachers. The units and the experiences gained using the units in the classroom will be shared by way of the telecommunications capabilities of the Mass LearnPike and a series of meetings, workshops, and conferences.

NECC is the higher education partner for the PALMS Northeast Regional Provider in the Merrimack Valley and embodies the PALMS philosophy an all hands-on curriculum units and training workshops conducted in math, science and technology. All professional development workshops and short courses support the Massachusetts Curriculum Frameworks for Math, Science and Technology.

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Simmons College

HealthNet: Inquiry-based Health Education Using Telecommunications

HealthNet is an inquiry-based health education enhancement program which uses the Internet as a means for engaging elementary students in learning about health behaviors and their consequences, sharing data, and gathering health information. HealthNet's mission is twofold: to enhance health education at the elementary school level through the use of telecommunications and inquiry-based learning, and to develop working partnerships between teachers and school nurses.

The Eisenhower Program is providing funds to support the participation of eleven to twelve new schools in HealthNet in 1996-1997. Each of the schools will send two teachers and the school nurse to a series of intensive workshops at Simmons College. Two pre-service teachers from the Simmons College Education Program and two students from the Simmons College Graduate Program in Primary Health Care Nursing will also attend. All participants will receive training in telecommunications and in the HealthNet Monitoring Projects (Attendance, Food For Thought, Sweet Tooth, Rest & Relaxation, Exercise, and Hygiene). Each of the monitoring projects have applications to multiple strands from the math, science, and health Frameworks. After the initial training at Simmons, training will continue online throughout the year through the use of a special listserv, which will be facilitated by Simmons College faculty members in the Departments of Education, Biology, Psychology, and Nutrition.

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Springfield College

Integrated Preservice Inservice Model: Science Technology Frameworks

The Integrated Preservice Inservice Model Project will provide elementary school teachers, especially those in the Springfield Public Schools, with innovative ways to implement the Massachusetts Curriculum Frameworks for Science and Technology in their classrooms, and in coordination with Springfield's new Student Outcome goals. Springfield College faculty worked with Springfield Public School personnel to design the project, consistent with the requirements of the Eisenhower Professional Development Program. Year 2 continuation will allow the Model Project to be implemented over an entire school year, building upon knowledge and experience gained from initial activities in Year 1.

Ecology will again be used to model the content and pedagogy of the Frameworks in preservice and inservice teacher training. Student teachers from Springfield College and veteran teachers from the Springfield Public Schools will be given the opportunity, in this inquiry based approach, to be learners, to reflect upon that experience and then to collaborate in translating that experience into their elementary classrooms. The five objectives for Year 2 are:

1. Springfield College preservice teachers will complete their elementary certification program with an understanding of the Science and Technology Frameworks and the skills and knowledge necessary to implement them in the public school classroom.

2. Inservice teachers in the Springfield Public Schools, as a result of project training and modeling the Frameworks pedagogy with student teachers from SC, will incorporate innovative teaching methodologies into their ongoing curriculum development.

3. Institutional objective: Springfield College teacher preparation faculty will incorporate elements of the Model's innovative pedagogy into their College teaching practices, with increased awareness and readiness to prepare preservice teachers to implement Massachusetts' Curriculum frameworks.

4. Elementary students in nine Springfield Public Schools will recognize that Ecology can be found everywhere, including their neighborhood's urban settings, and will understand the scientific concepts behind environmental issues affecting their lives.

5. Dissemination: Year 1 cooperating teachers will continue as mentors to Year 2 cooperating teachers selected from the same school, building toward a "critical mass" of teachers at participating schools. Project staff will make presentations at College forums and professional conferences.

Inservice teachers will attend a two-week summer workshop. Through prepracticum course work and practicum experience in elementary classrooms, preservice teachers at Springfield College will receive comparable training and practice

in using the Ecology model. The project will facilitate the development of College and Public School teachers to support one another after the integrated preservice-inservice professional training.

For more information, please contact:

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Springfield Technical Community College

Confronting The Frameworks

Project will address identified training needs of Springfield Public School faculty designated to teach in the new High School of Science and Technology. The project will provide training to 30 teachers in the following: a) utilizing the Internet, b) responding to the needs of diverse learners and extended class periods through alternative teaching strategies and classroom management techniques, and c) connecting math and science through integration of project-based and group activities in Probability and Statistics. A 14-hour INTERNET LIVE! workshop-to include Internet basics, specific tips for educators, and follow-up trouble-shooting will be offered between September and June. In Summer '97, a week-long Institute and accompanying handbook for math and science teachers will help them to:

- increase the quality rather than quantity of instruction provided in extended periods;
- develop depth as well as breadth in student understanding of key math concepts; and
- demonstrate the interconnectedness of math, science, and other common core areas through group projects requiring effective communication, reasoning, and critical thinking skills.

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Thompson Island Outward Bound Education Center

Outward Bound Summer Institute for Interdisciplinary Science-Based Learning

For the second year, TIOBEC, in partnership with Northeastern University's Center for Innovation in Urban Education, the Boston Public Schools, Expeditionary Learning Outward Bound, and the Massachusetts Water Resources Authority will run the Outward Bound Summer Institute for Interdisciplinary Science-Base Learning. The program is a professional development program for Boston teachers which has, in conjunction, an academic summer school for Boston middle-school students.

The goal of the program is to improve the teaching of science by developing interdisciplinary teaching skills. Targeted are science, math and humanities teachers. Using Thompson Island and Boston Harbor as an example of a field site, 30 Boston teachers (inservice, preservice and induction), with the guidance of Outward Bound professionals, will develop and deliver interdisciplinary science-based curriculum for use in their classrooms. The 60 Boston middle school students in the program are instructed by teams of the teachers who practice their curriculum on the students.

The pedagogy and methods in the Institute are based on the work of Expeditionary Learning Outward Bound, a nationally established school reform initiative where teachers become guides in the design and delivery of 'learning expeditions'. The Institute opens with a three-day Outward Bound Research expedition on board TIOBEC's sail and motorized vessels in and around Boston Harbor. It is followed by a five-day component which focuses on curriculum/learning expedition development prior to student contact. Once the students have arrived, teams of teachers and students practice the curriculum. At the end of each day, time is devoted to evaluation, documentation and planning.

The curriculum is interdisciplinary using the Boston Harbor as a central theme, and science as a focus. Teachers will receive instruction and on-going coaching and support throughout and beyond the program. As an outcome, teachers are able to apply the expeditionary learning methodology to create additional learning expeditions which utilizes the areas urban, historical, cultural and natural resources.

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University of Massachusetts Amherst

The STEM ED Project: A Multiple Strategy Approach to Professional Development in Science Education

The STEM-ED Project: A Multiple Strategy Approach to Professional Development in Science Education is a joint effort of the University of Massachusetts and the Amherst, Franklin County, Hadley, Holyoke, and Northampton schools. It will offer a coordinated program of professional development science workshops and courses for teachers at all K12 grade levels and for preservice teachers that stresses inquiry-based learning while presenting science content designed to implement the Massachusetts Curriculum Frameworks. In accordance with the Massachusetts Department of Education professional development standards and its emphasis on multiple strategies, there will be three components designed to address different target audiences and needs:

- Nutrition Science Online, an Internet-based distance learning course for secondary science teachers.

- Electricity and Magnetism, a 3 credit graduate/undergraduate course for inservice and preservice teachers (grades 4-8).

- Light, a series of workshops for K-3 teachers.

The curricula for the courses and workshops employ a problem-solving approach, emphasizing exploring material in depth rather than rote memorization of facts. Participants will pose and learn how to answer their own questions in order to discover scientific relationships. Emphasis will be placed on asking questions, making hypotheses, gathering information, analyzing data, and defining new questions and improved hypotheses.

The Internet will be used to provide support to the participating teachers during and after the project. It will help to bridge the gap between higher education institutions, inservice teachers, and learners. It will enable the teachers to communicate with each other, the project staff, and other professionals around the world, and to use the global information resources of the information superhighway.

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University of Massachusetts Amherst

Implementation of Technology Across the Secondary Mathematics Curriculum

We propose to provide a series of opportunities for professional growth for secondary school mathematics teachers in the Chicopee, Easthampton, Hampshire Regional, and Holyoke Public Schools. Specifically, we will plan and present in-service workshops and training sessions during the academic year 1996-1997 and a two-week seminar during the summer of 1997 the theme will be the implementation of the TI-92 calculator throughout the secondary mathematics curriculum (algebra, geometry, trigonometry, probability and statistics, and calculus). Woven throughout will be the threads of applications of mathematics and statistics to the social and physical sciences. Problem recognition, formulation, and solving will be stressed and elementary mathematical modeling will be employed whenever possible. The Curriculum and Evaluation Standards and the Professional Standards of the National Council of Teachers of Mathematics (NCTM) will be very much in evidence as well as the Commonwealth's Curriculum Frameworks for Mathematics and Science. A byproduct of the project will be the production and distribution of materials for use by mathematics teachers in the Commonwealth and cross referenced with the NCTM standards and the Commonwealth's Curriculum Frameworks. These materials will be suitable for use by preservice secondary school mathematics teachers.

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University of Massachusetts Boston

Harbor Explorations - A Link to Coastal Networks

Harbor Explorations is a professional development science program focusing on the marine environment as a learning lab. Located in the Institute for Learning and Teaching at the University of Massachusetts Boston, Harbor Explorations is a collaborative program with Massachusetts Marine Educators, Project Oceanology of Groton, CT, The National Marine Sanctuary, Stellwagen Bank, WhaleNet and Environet.

Harbor Explorations supports a wide range of programs dedicated to the goals of:

- Providing a variety of professional experiences that give teachers and pre-service teachers the opportunity to increase their knowledge of the marine environment and the professional organizations dedicated to marine science education.

- Training and supporting teachers as they learn to incorporate project based, hands-on, inquiry oriented activities focusing on the marine environment into existing science curricula and programs.

Activities include Programming aboard Enviro-Lab III, a 65 foot research vessel for both teachers and students; a two week, intensive Summer Institute for Teachers, and direct cooperation in planning with teachers when they bring their classes to Harbor Explorations for on-the-water programming. Other activities include support of Massachusetts Marine Educators Annual Teacher Meeting at Woods Hole Oceanographic Institute and the High School Marine Studies Symposium at UMass Dartmouth.

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University of Massachusetts Dartmouth

The Rim Program For Middle School Science and Mathematics

This is a program for 40 regional middle school teachers of mathematics and science from eight school districts; urban and rural. In addition to professional development, the participants also have the opportunity of earning up to nine graduate credits in the UMass Dartmouth MAT program. The areas of professional growth will be as follows:

- **Conceptual understanding of important ideas in mathematics and science**, especially those appropriate for students at middle or junior high school. This will be linked to the Massachusetts Curriculum Frameworks for Mathematics and Science and Technology and national standards.

- **Effective pedagogy**. This will be linked to the Common Core of the Massachusetts Curriculum Frameworks. Authentic assessment will be especially highlighted.

- **Leadership** including mentoring and peer coaching. The exploration about what we know about individual and institutional change will occur throughout the program. In addition, we shall work on effective communication and skills and highlight the work of Steven Covey.

Work in these three areas will be interwoven throughout the program, but in each section of the program, there will be a different primary focus. The first course is entitled "The Guiding Principles of the Frameworks" and will focus on pedagogical strategies that help teachers to fulfill the principles. The second course is "Authentic Assessment in Mathematics and Science". During the third course, "Systems in Nature, Refining Our Understanding", participants will have the opportunity to hone their understanding of science and mathematics concepts and will become familiar with exemplary software and electronic probes.

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University of Massachusetts Lowell

Powerful Connections: A Professional Development Collaborative for Lowell Mathematics Middle School Teachers

The Professional Development is based on mathematics as its core discipline, but will address the integration of mathematics with other disciplines, including Science, Social Studies, and educational Research, and will focus on enhancing of both content and method.

Seven teacher leaders and thirty Lowell middle school teachers will gain experience in and change their practice in:

1. the development of interdisciplinary teaching modules which use problem solving in both classroom and community environments;

2. observation and analysis of successful teaching based on a constructivist approach; and

3. techniques for conducting research on classroom practice and evaluating the success for their own experimental innovations.

The project is timed specifically to assist Lowell's Middle Schools in responding to the new Massachusetts Mathematics Curriculum Frameworks. This project utilizes the unique resources of the Lowell Public Schools, UML, Lowell National Historical Park, and Tsongas Industrial History Center to create experiential staff development experience for searchers and problem-centered, interdisciplinary investigations for students.

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Wheelock College

The Boston Guides for Elementary School Science Units

This project intends to support the Boston Public Schools' new learning standards in science by providing two PALMS-trained teachers at each elementary grade level (K-5) with exemplary commercially produced science curriculum units which address those standards. Participating teachers will be asked to implement the units in their classrooms, and document how children interact with the units. The teachers will then write up their experiences in the form of grade-level guides to be distributed to all BPS teachers at that grade level. Each guide will thus include examples of student work as well as teachers' impressions of the units.

The specific objectives are to:

1. support Boston elementary schools and teachers as they implement the system's new learning standards in science;

2. provide opportunities for teacher leaders to have first-hand experiences implementing standards based exemplary science curriculum units and to document their experiences; and

3. disseminate the classroom experience of these teachers to all other Boston teachers at their grade level.

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